

Activity #2: You Live Where?

Flora and Fauna

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<p>Subjects: Science, Math</p> <p>Skills: Analysis, classification, comparing, description, identification, listing, small group work</p> <p>Duration: 1 hour</p> <p>Group size: 8-12 students</p> <p>Setting: outdoors for collection</p> <p>Vocabulary: berm, diversity, dune crest, dune slope, intertidal zone, sand fence, swale, transect, wrack line</p> <p>SC Science Standards: Grade 6: IA1b2; IA1d1; IA1e1; IA2a,b,c,g; IA3a; IA6a,b; II (Fungi and Plants) C1d; C3c. Grade 7: IA1b2; IA1d1; IA1e1; IA2a,b,c,g; IA3a; IA6ab; II (Ecology – Biotic) D1a, D2a. Grade 8: IA1b2; IA1d1; IA1e1; IA2a,b,c,g; IA3a; IIA2a,b.</p>

Objectives

Students will learn:

- 1) to identify flora and fauna of the beach;
 - 2) to identify fauna that live beneath the sand;
 - 3) the relationships between beach life and habitat; and
 - 4) proper methods of collecting specimens.
- Students survey the plants and animals along a segment of the beach.

Background

This activity is an extension of the previous activity, *The Dynamic Beach*. The beach is a continuously changing environment. In this harsh landscape, plants and animals must be adapted to extremes in temperature, wind, and sunlight. Beach temperatures vary from below freezing in winter to well over 100°F. The beach gets the full effect of strong ocean winds. Sand grains carried by the wind batter everything in their paths, and the moving sand grains cause the land surface to change in elevation and shape. Additionally, salt is an ever-constant threat to plants, forcing all but the hardiest species to grow away from the shore. Fresh water is scarce and lies deep beneath the surface.

This activity allows students to discover the flora and fauna that survive the tough beach environment. They will identify plants and animals and estimate their population densities along a beach profile **transect**. A transect is a study of elevation changes done along a line perpendicular to the shore. Students may then make inferences about the beach environment. Note: Although shells that are deposited on the beach are signs of life, they denote life *in* the ocean, not *on* the beach itself. Thus, seashells should not be included in the data collection. However, remains from ghost crabs or other beach-dwelling organisms may be recorded.

Materials:

- *A Guide to a Georgia Barrier Island* by Taylor Schoettle (photocopy and laminate select pages for ease in identification)
- several hula-hoops for stations
- two buckets
- trowel or large shells for digging
- ruler or measuring tape
- Activity #2 Data Sheet, page 25
- clipboard and pencil
- thermometer
- “wet sieve” or screen
- blank paper to record temperature of sand
- plant press (for extension)

Procedure

As one group of students is making the transect, have another group follow behind them to study life along the transect. Have the group choose several (6 or 7) sites which they would like to compare. Ensure that the

sites are different from one another; for example, examine life at the top of a back dune, in a swale, at the top of the primary dune, at the **wrack line**, in the **intertidal zone**, etc. Allow the students to choose a place along the profile transect as their first study site, or station. While the profile transect is occurring, the life science group should record the distance along the profile transect for each station chosen. Place a hula-hoop at each site when distance is measured by the profile transect group in order to mark the site for later study. They will need to choose at least one of each of the following for their study sites: **dune peak**, **swale**, **berm**, **sand fence** (if applicable), and **dune slope**. At each station, the students should tally the different species of plants and any animals or animals signs they see within the hula hoop area. Use “Activity #2 Data Sheet” (page 25) to record the number of specimens observed. Mark them on the data sheet with



Figure 2-1: Identifying plant species and number of individuals within the hula hoop area in the field.

a tick mark, e.g. |. Multiple tick marks should be recorded by fives, e.g. $\overline{\text{|||||}}$. After each station, record the animal diversity and plant diversity. **Diversity** is the number of species (not specimen) found at each station.

Extensions

Have your students study the life *beneath* the sand. If you are surveying at low tide, allow them to choose three intertidal sites to study along the profile transect line. Record the location of each site as a distance from the starting point. These sites should be spaced accordingly: one near the high tide line, one near the surf, and one in between. Mark off a one-square foot area at each site.

Dig down six inches and place the sediment into one bucket, and then dig down another six inches and place that into a different bucket. Measure the temperature of the six different locations and depths. Is there any variation? Is the temperature constant at the same depth? What would that mean for the life beneath the sand? Examine the contents of each bucket. Use the wet sieve (a screen framed with wood) to separate the large items from the smaller ones. This may make it easier to count organisms, such as coquina clams, and also to estimate the amount of shell fragments and the grain sizes found at depth. Compare the results for each site.

You may wish to assist your students in collecting one good specimen of the different plant species they see. (Do not collect sea oats; there is a \$200 fine per sea oat!) An easy way to do this is to use a plant press (see Resource Index). Once the plants are pressed, make color photocopies of each specimen, or laminate them, for your collection. The photocopies are useful to decorate the drawing of your beach profile (see *Constructing a Profile of the Beach Environment*).

Activity #2 Data Sheet

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adapted from "Beach Exploration," Wendy Allen and Patty Owens-McLaughlin, *Sea Sampler*.

Station #		YLW 1	YLW 2	YLW 3	YLW 4	YLW 5	YLW 6	YLW 7	
Location (distance from BM, or data point number from beach survey)									
Description of location									
number of specimens per unit area	ANIMALS	mole crabs							
		insects							
		polychaetes							
		amphipods							
		ants							
		animal signs (tracks, burrows, fecal matter)							
		other							
		other							
	PLANTS	total % cover							
		sea oats							
		sea rocket							
		pennywort							
		russian thistle							
		beach elder							
		sandspur							
		camphorweed							
		dune spurge							
		beach primrose							
		croton							
		panic grass							
		salt meadow cordgrass							
		other							
other									
other									
Animal diversity (number of animal <i>species</i> at each station)									
Plant diversity (number of plant <i>species</i> at each station)									